

OKLAHOMA Agricultural Experiment Station

STILLWATER, OKLAHOMA.

CIRCULAR OF INFORMATION NO. 12

Summary of Experiment Station Work.

The following is a brief statement of the lines of work which engaged the attention of the Oklahoma Experiment Station and its organization in 1891. Bulletins have been published from time to time covering this work fully, and giving in detail the results of all experimental work carried on by the Station. These bulletins may be had free of charge by applying to the Director of the Station.

ALFALFA:—A well prepared seed bed is essential. Autumn sowings have given more satisfactory results than the spring sowing. It pays to test alfalfa seed. This plan insures a full germination; and it also prevents the farmer from scattering numerous weed seeds. Oklahoma grown seed should be used. The alfalfa renovator assists in holding crab grass in check.

COTTON:—Thorough cultivation should be given during the early stages of growth. Farmyard manure can be applied in rotation with beneficial effect. The cotton plant responds readily to selection, thus the grower can expect to bring about marked changes provided the work is done systematically.

WHEAT:—Land, which has been cropped continuously to wheat from the inception of our investigation, gave an average yield of 14.7 bushels per acre for an eight year period ending with the harvest of 1906. Similar land which was treated with farmyard manure at the rate of five and one half tons per annum gave an average yield of 25 bushels per acre for the same period. Early

(July) plowing has given better returns than the August or September plowings.

October 1-15 is the most desirable time to sow wheat in Central Oklahoma. Pasturing wheat, even to a moderate degree, has a tendency to reduce the yield per acre except where the wheat plant has made an exceptionally strong growth early in the autumn. Many of the varieties tested on the Station farm have shown themselves to be well adapted to soil and climatic conditions in this state. Sibley's, New Golden, Turkey Red, and Missouri Blue Stem are good strains.

OATS and BARLEY:—Varieties of winter oats and barley have been grown with some measure of success.

INDIAN CORN:—Our yields in the case of this crop have been increased, first, by giving the soil good tillage; second, by applying normal amounts of farmyard manure to the land; and third, we believe that careful selection will accomplish much in the improvement of this cereal.

KAFIR CORN:—Kafir corn has proven itself to be a very valuable plant in this section. It appears to stand the hot dry weather during July and August much better than Indian corn and it has made good crops of grain when the Indian corn crop utterly failed.

SORGHUM:—Sorghum is one of our best forage plants. Drilling the seed in rows thirty to thirty-six inches apart in order to permit cultivation, will give more profitable yields in the more unfavorable seasons than the practice of sowing the seed broadcast.

COWPEAS:—This plant bears the same relationship to agriculture in the south, that red clover takes in the north. Nitrogen can be obtained through the microscopic plants which are associated with the root system of the cowpeas. The whip-poorwill variety gives excellent results from the standpoint of grain production.

CASTOR BEANS:—For several years the castor bean industry decreased in Oklahoma and finally reached the point where the crop became unprofitable on account of the degeneracy of the seed produced. The Station undertook the problem of breeding

on a superior strain of castor bean and was successful in producing two types that presented very desirable characteristics.

VARIETIES OF FRUITS AND VEGETABLES:—Experiments and tests prove that a long list of varieties of vegetables and fruits is well adapted to growing in Oklahoma. The list of varieties is quite as extensive as can be grown in nearly any other state.

TREES, SHRUBS AND VINES:—Many varieties of trees suitable for post and fuel production have been tested and the catalpa has proven to be the best on bottom lands. The Osage orange, black locust, and Russian mulberry are favorites for upland. A system of planting that will permit of cultivation is always preferred. A study of ornamental trees, shrubs, and vines adapted to Oklahoma planting has been carried on at the same time and a long list of ornamentals can be recommended for planting in special locations.

NATIVE PLANTS:—A catalog of over 700 plants native to Oklahoma has been published and in this are listed the most common plants found in the central part of Oklahoma.

FLORA OF OKLAHOMA:—The Flora of Oklahoma was taken up several years ago, and a very creditable catalog of the native plants of Oklahoma was prepared.

PLANT DISEASES:—Several plant diseases have been studied, and remedies found to be of considerable value were published. Among the diseases investigated were Kafir corn smut, wheat smut, and apple leaf rust.

WEEDS:—The most troublesome weeds have been thoroughly described and methods of culture and cropping for the eradication of these weeds are briefly recommended for each.

SPRAYING:—Actual tests demonstrate that thorough spraying of apple trees will protect as high as 85 to 90 per cent of the fruit from the attacks of any insect or fungus disease. Eighty per cent of the peach crop may be protected from the attacks of insects and fungus diseases by careful, systematic spraying. Thorough use of the spray pump is capable of increasing the fruit crop of Oklahoma to five times its present value.

CHINCH BUG:—Several lines of experiments have been carried out with the chinch bug. None of these demonstrated

any more practical way for fighting the chinch bug than by means of barriers and trap crops. It is found in working with this insect, however, the so-called "chinch bug disease" did not require to be introduced, for it is widely spread over the farms and requires only favorable conditions to make it effectual in destroying chinch bugs.

BEE-KEEPING:—In bee-keeping, the Station has done a little work toward determining the profitableness of bee-keeping in Oklahoma. This work was done in 1899 and 1900 and the results indicated then that on the upland prairies with the ordinary attention given to bees, they will store but little surplus honey; and that they will need to be fed heavily in the fall in order to have them winter safely. In the river bottoms, if one is an experienced bee-keeper, he may secure some surplus honey by giving the bees extraordinary care.

GREEN BUG:—The "green bug" appeared in Oklahoma in 1901 and 1907, and both times experiments were conducted with this insect and each time it was demonstrated that the insect must be held in control by its natural enemies. Spraying experiments were conducted each time with very little success. Each time was found, however, that the predaceous and parasitic insects were able to destroy this louse whenever the weather conditions were favorable for their operations.

INSECTS:—The life histories of several insects have been closely studied, which information is the first requisite for successful and effectual applications of remedial measures. The plum curculio, the codling moth, the cotton ball worm, San Jose scale, and the chinch bug have been studied under laboratory conditions at all their stages, and the development of these insects has also been closely watched and recorded.

SAN JOSE SCALE:—The Entomologist has found San Jose scale in several parts of Oklahoma, and has given advice to the owners of infested trees as to the best method of destroying this pest. A series of experiments with different spraying solutions were followed and it was found that the lime and sulphur solution was the best substance to use for destroying this insect.

NURSERY LAW:—The spring of 1905, the Entomologist became by law the acting nursery inspector under a new nursery

law. The duties of this inspection required the Entomologist to visit all the nurseries of the territory or state during the summer months. This work has been faithfully performed each season and as a result, the nursery conditions of the state have markedly improved.

GRASSES FOR FORAGE:—Tests made of over two hundred different grasses showed that very few tame grasses are adapted to our Oklahoma soils and climate except in favored localities. Hardy Bermuda grass is far superior to all others both for hay and pasture purposes and will grow equally well on clay or sandy soil. Bermuda can be cut two or three times each season and yields a hay superior to any other grass. Hogs, sheep, cattle and horses can be pastured upon it. Large quantities of the hardy Bermuda roots have been sent free of charge to all parts of the state.

WATER ANALYSIS:—An analysis of river and creek waters with a view of determining their value for irrigation purposes show that the water in all the rivers except the Cimarron and Salt Fork of the Arkansas may be used for irrigation. The only creek that is unsafe is the Black Bear. A large number of bacteriological examinations of water from ponds, tanks, wells and cisterns is made each year. In this way the Station has been of great assistance in the building and maintenance of sources of a pure water supply.

CHEMICAL ANALYSIS.—The Chemical laboratory has analyzed from two to five hundred samples of material of various kinds. Most of this work has been done in answer to inquiries concerning the composition of mineral, stones, ore etc. The result of these analyses have usually been of interest to communities.

FEEDING TRIALS:—A number of feeding trials have been made with both hogs and cattle. Cotton seed, cotton seed meal, corn, Kafir corn and wheat have been used in rations, also various kinds of roughness. Cotton seed to the amount of eight or ten pounds per day is profitable cattle feed. It should be fed with alfalfa or cowpeas for roughness. Kafir corn should be ground if fed to steers. Fifty six per cent of the whole grain

passes through the animal undigested while only twelve per cent of the ground grain is lost. The same is true to some extent of wheat. Hulls or chopped hay should be fed with ground grain. Cotton seed meal and hulls or chopped hay makes a cheap ration. Corn and alfalfa at average prices are the best and most economical for fattening steers. Cotton seed meal should not be fed in any form to young pigs or calves. Older animals may be fed a ration containing one fifth cotton seed meal with good results.

The Veterinarian has manufactured and distributed in Oklahoma over 700,000 doses of vaccine for the prevention of black leg in cattle. It is estimated that not less than \$100,000 per annum has been saved for the stock men of the state through this one branch of the Station's work.

A complete life history of the Texas fever tick was worked out and means of combating it described. Curative treatment is of no avail. The only means of preventing the disease is to destroy the tick. This may be done by dipping the cattle in crude oil or by pasture rotation or by both combined. The different kinds of ticks have been described and the differences between them pointed out.

DISINFECTANTS:—The bactericidal properties of various disinfectants have been worked out and recommendations as to their use given out. Formalin and carbolic acid are the most valuable ones.

